

CLAIMS:

1. Method of enabling at least identification the presence data symbols that have been embedded in a media comprising the steps of:
 - obtaining a transmitted media signal (r), (step 22), which comprises a possibly distorted version of a host signal in which data symbols have been embedded by quantisation
 - 5 using a certain quantisation step size and to which dither with a set of dither values has been added,
 - providing several dither value intervals within the set, where each interval corresponds to one or a small number of dither values, (step 26),
 - determining a histogram for each dither value interval, where a histogram is
 - 10 determined for all sample values of a set of signal samples of the transmitted media signal (r) and having a dither value(s) in the corresponding dither value interval, (step 30),
 - combining the separate histograms corresponding to the intervals into a single histogram, (step 31), and
 - determining at least a rescaling factor ($1/R$) based on the combined histogram,
 - 15 (step 32), in order to estimate the quantisation step size.
2. Method according to claim 1, further comprising the steps of estimating an offset (O) of the transmitted media signal, (step 32), and removing the estimated offset from the signal, (step 34).
- 20 3. Method according to claim 1, further comprising the step of rescaling the signal using the rescaling factor ($1/R$) in order to at least approximately restore the original media signal having embedded data, (step 36).
- 25 4. Method according to claim 3, further comprising the step of processing the rescaled signal (r') in order to detect or extract the embedded data, (step 38).
5. Apparatus (10) for enabling at least identification the presence of data symbols that have been embedded in a media signal and comprising:

a signal obtaining unit (12) arranged to obtain a transmitted media signal (r) comprising a possibly distorted version of a host signal in which data symbols have been embedded by quantisation using a certain quantisation step size and to which dither with a set of dither values has been added, and

- 5 a signal distortion determining unit (14) arranged to:
 provide several dither value intervals within the set, where each interval corresponds to one or a small number of dither values,
 determine a histogram for each dither value interval, where a histogram is determined for all sample values of a set of signal samples of the transmitted media signal
10 having a dither value in the corresponding dither value interval,
 combine the separate histograms corresponding to the intervals into a single histogram, and
 determine at least a rescaling factor ($1/R$) based on the combined histogram in order to estimate the quantisation step size.

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6. Apparatus according to claim 5, wherein the signal distortion determining unit is further arranged to estimate an offset (O) of the transmitted media signal and further comprising a unit (16) arranged to remove the estimated offset from the signal.

- 20 7. Apparatus according to claim 5, further comprising a multiplying unit (18) arranged to multiply the rescaling factor ($1/R$) with the transmitted media signal in order to at least approximately restore the original media signal having embedded data.

8. Apparatus according to claim 7, further comprising a watermark detecting unit
25 (20) arranged to process the rescaled signal (r') in order to detect or extract the embedded data.

9. Computer program product (40) for enabling at least identification the presence data symbols that have been embedded in a media signal, comprising a computer
30 readable medium having thereon:
 computer program code means, to make the computer do, when said program is loaded in the computer:

- for an obtained transmitted media signal comprising a possibly distorted version of a host signal in which data symbols have been embedded by quantisation using a certain quantisation step size and to which dither with a set of dither values has been added, provide several dither value intervals within the set, where each interval
- 5 corresponds to one or a small number of dither values,
- determine a histogram for each dither value interval, where a histogram is determined for all sample values of a set of signal samples of the transmitted media signal having a dither value in the corresponding dither value interval,
- combine the separate histograms corresponding to the intervals into a single
- 10 histogram, and
- determine at least a rescaling factor based on the combined histogram in order to estimate the quantisation step size.